CLAIMS

What is claimed is:

1. An adaptive filter, comprising:

a commutator having an input for receiving a signal to be filtered and providing a plurality of commutated outputs;

a plurality of filter banks that each comprise a plurality of polyphase filters having an input and an output, and wherein the outputs of the plurality of filters are combined to produce a single output signal of the respective filter bank;

wherein the commutated outputs of the commutator are directly coupled to inputs of the filters of a first filter bank;

wherein the commutated outputs of the commutator are coupled by way of a plurality of first delay elements to inputs of the plurality of polyphase filters of a second filter bank; and

wherein the commutated outputs of the commutator are coupled by way of a plurality of second delay elements to inputs of the plurality of polyphase filters of a third filter bank.

2. The adaptive filter recited in Claim 1 wherein the plurality of filter banks each comprise a polyphase filter integrated circuit.

3. The adaptive filter recited in Claim 1 wherein each of the plurality of polyphase filters comprise a short-length polyphase finite impulse response filter.

4. A filtering method comprising the steps of:

commutating an input signal to be filtered to provide a plurality of commutated signals;

providing a plurality of parallel filter banks each comprising a plurality of polyphase filters;

filtering the plurality of commutated signals using the plurality of polyphase filters of a first filter bank to generate a first plurality of filtered signals;

delaying each of the plurality of commutated signals by a first delay value and adaptively filtering each of the plurality of delayed commutated signals using the plurality of polyphase filters of a second filter bank to generate a second plurality of filtered signals;

delaying each of the plurality of commutated signals by a second delay value and adaptively filtering each of the plurality of delayed commutated signals using the plurality of polyphase filters of a third filter bank to generate a third plurality of filtered signals; and

respectively combining the first, second and third pluralities of filtered signals to produce first, second and third filtered output signals that correspond to a filtered version of the input signal.

5. The filtering method recited in Claim 4 wherein the step of filtering the plurality of commutated signals comprises adaptively filtering the plurality of commutated signals.

6. The filtering method recited in Claim 4 wherein the plurality of filter banks each comprise a polyphase filter integrated circuit.

7. The filtering method recited in Claim 4 wherein each of the plurality of polyphase filters comprise a short-length polyphase finite impulse response filter.

8. The filtering method recited in Claim 4 further comprising the step of double buffering the input to allow filter coefficients to be changed and provide adaptive filter coefficient updates.